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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,007	08/22/2003	Rudolf Neumuller	ZAHFRI P532US	8962

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EXAMINER

ROSENBERG, LAURA B

ART UNIT	PAPER NUMBER
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3616

DATE MAILED: 06/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/646,007

Applicant(s)

NEUMULLER ET AL

Examiner

Laura B. Rosenberg

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 12-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8/22/03; 8/30/04</u> | 6) <input type="checkbox"/> Other: ____ |

5-0-0

DETAILED ACTION

1. The preliminary amendment submitted on 22 August 2003, in which claims 1-11 were canceled and claims 12-22 were added, has been entered.

Claim Objections

2. Claim 12 is objected to because of the following informalities:

“the output spur gear (2)” should be --the input spur gear (2)-- (line 5);

“the axis of rotation (10) of the input spur gear (2)” should be --an axis of rotation (10) of the input spur gear (2)-- (line 12).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 12-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regards to claims 12 and 21, the use of the terms “vertical” and horizontal” is unclear. Per claim 12, it appears that the vertical spacing between each axis and the ground is a spacing that occurs along a vertical line. However, per claim 21, it appears that the vertical spacing between the two axes is along a horizontal line, and the horizontal spacing actually occurs along a vertical line. If the applicant has merely

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mixed up the terms in claim 21, then changing "vertical spacing" to --horizontal spacing-- and changing "horizontal spacing" to --vertical spacing-- would overcome this portion of the 35 U.S.C. 112 rejection. However, if the applicant intended for the terms to be as currently claimed, then further explanation is needed to clarify this discrepancy.

In regards to claims 19-21, the phrases "range of about 2.2", "range of about 1.8", "range of about 189mm", and "range of about 30mm" render the claims indefinite. A range must be defined by an upper and lower limit, and only one limit is set forth for each of these ranges.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 12, 13, 17-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Varela et al. (6,886,655) and supported by Tanzer et al. (6,095,005). Varela et al. disclose a gantry axle (including #84, 90) comprising:

- Driven differential gear unit (not shown, but is old and well known in the art that a driven differential gear unit is needed in a drive unit assembly to transfer torque

between the drive unit and the driven axle; further supported by driven differential gear unit #10 in Tanzer et al.)

- Axle shaft (including #114)
- Gantry transmission (including #96)
- Vehicle wheel (#106) rotatable about an axis of rotation (#94)
- Ground (#88)
- Input spur gear (#112) driven by the axle shaft and rotatable about an axis of rotation (#92)
- First (#118) and second (#120) intermediate spur gears rotatable about an axis of rotation (#124)
- Output spur gear (#116) connected with the vehicle wheel and rotatable about the vehicle wheel axis of rotation (#94)
- “Vertical” spacing of input spur gear axis of rotation (#92) to the ground is smaller than a “vertical” spacing of intermediate spur gears axis of rotation (#124) to the ground and is smaller than a “vertical” spacing of output gear axis of rotation (#94) to the ground (best seen in figure 7; column 5, lines 10-17)
- Input spur gear axis of rotation (#92) is spaced from the intermediate spur gears axis of rotation (#124; best seen in figure 7)
- Intermediate spur gears axis of rotation (#124) is spaced from the output gear axis of rotation (#94; best seen in figure 7)
- Axle shaft (#114) is situation on an upper inner limit of an axle bridge (not labeled, but best seen in figure 6)

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- Input spur gear (#112) is mounted in a housing (#98) of the gantry transmission (#96)
- Ratio between the input spur gear (#112) and the first intermediate spur gear (#118) is "in a range of about 2.2" (best seen by counting gear teeth in figure 7)
- Ratio between the second intermediate spur gear (#120) and the output spur gear (#116) is "in a range of about 1.8" (best seen by counting gear teeth in figure 7)
- "Horizontal" spacing between the output spur gear axis of rotation (#94) and the input spur gear axis of rotation (#92) is "in a range of about 189mm" (#D2; between 180-230mm; column 5, lines 17-18)
- "Vertical" spacing between the output spur gear axis of rotation (#94) and the input spur gear axis of rotation (#92) is "in a range of about 30mm" (D3; while figure 7 may not be drawn to scale, if #D2 is between 180-230mm, then #D3 would be about 30mm)
- Axle bridge is situated offset in a travel direction relative to the vehicle wheel axis of rotation (though not shown in figure 7, axle bridge is the housing that surrounds axle #114, and thus would be offset in a travel direction relative to the vehicle wheel axis of rotation #94)

The examiner notes that a ratio between gears is simply determined by dividing the number of teeth of the larger gear by the number of teeth of the smaller gear. Further, Varela et al. disclose adjusting the diameters of the gears, which would affect the number of gear teeth, in order to reach a desired gear reduction for a specific vehicle application (column 4, lines 61-67).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Varela et al. (6,886,655) in view of Tanzer et al. (6,095,005). Although it is old and well known in the art that springs are used to connect an axle with a vehicle chassis, Varela et al. do not specifically disclose this feature. Further, Varela et al. do not disclose the spur gears having helical cut teeth.

Tanzer et al. teach a gantry axle (best seen in figure 2) comprising:

- Driven differential gear unit (#10)
- Axle shaft (including #18, 20)
- Gantry transmission (best seen on left side in figure 2)
- Vehicle wheel (#50) rotatable about an axis of rotation (not labeled; central axis through output shaft #44)
- Input spur gear (#76) driven by the axle shaft and rotatable about an axis of rotation (not labeled; central axis through input shaft #20)
- Output spur gear (#82) connected with the vehicle wheel and rotatable about the vehicle wheel axis of rotation (best seen in figure 2)
- "Vertical" spacing of input spur gear axis of rotation to the ground is smaller than a "vertical" spacing of output gear axis of rotation to the ground (best seen in figure 2)

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- Spur gears have helical cut teeth (column 2, lines 63-64)
- Spring carriers (including #58, 62) connect the gantry axle with the vehicle chassis and are connected with the gantry transmission (via sleeve #56)

It would have been obvious to one skilled in the art at the time that the invention was made to modify the spur gears of Varela et al. to include helical cut teeth as claimed in view of Tanzer et al. so as to provide high contact ratio teeth (Tanzer et al.: column 2, lines 63-64). Further, it would have been obvious to one skilled in the art at the time that the invention was made to modify the gantry axle of Varela et al. to include spring carriers as claimed in view of Tanzer et al. so as to secure the axle and wheel with the vehicle chassis while supporting the vehicle chassis and absorbing shock (Tanzer et al.: column 2).

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Varela et al. (6,886,655) in view of Tanzer et al. (6,095,005), further in view of Singer (3,150,531). Varela et al. do not specifically disclose a sloping angle of the gear teeth of the intermediate gears being designed so that the axial forces of the intermediate spur gears are substantially neutralized.

Singer teaches a gantry axle (#10) comprising:

- Driven differential gear unit (within casing #12)
- Axle shaft (including #22)
- Gantry transmission (including #20)

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- Vehicle wheel (#48) rotatable about an axis of rotation (not labeled; central axis through output shaft #32)
- Input gear (#25) driven by the axle shaft and rotatable about an axis of rotation (not labeled; central axis through input shaft #22)
- Output gear (#36) connected with the vehicle wheel and rotatable about the vehicle wheel axis of rotation (can be seen in figure 4)
- “Vertical” spacing of input gear axis of rotation to the ground is smaller than a “vertical” spacing of output gear axis of rotation to the ground (best seen in figure 4)
- Sloping angle of the gear teeth are designed so that axial forces of the gears are substantially neutralized (column 3, lines 59-68)

It would have been obvious to one skilled in the art at the time that the invention was made to modify the gears of Varela et al. to include a sloping angle of the gear teeth as claimed in view of Singer so as to neutralize the stresses encountered by the axle when the vehicle is fully loaded, thus extending the useful life of the axle and producing less wear and stress on the gears (Singer: column 3, lines 59-68).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Herrington discloses a raised axle with an input gear, output gear, and intermediate gears.

Brownier discloses a double reduction gear set with helical teeth.

Fisher and Maurer et al. each disclose a gantry axle and a gantry transmission that connects an axle to a wheel.

Wolansky discloses a gantry axle and a gantry transmission with input and output helical gears with specific gear ratios.

Wendl et al., Varela, and Boccenti each disclose a gantry axle and a gantry transmission with helical gears.

Bennett et al. disclose a gantry axle and a gantry transmission with an input gear, output gear, and intermediate gears.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura B. Rosenberg whose telephone number is (571) 272-6674. The examiner can normally be reached on Monday-Friday 7:00am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Dickson can be reached on (571) 272-6669. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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